



**Data Dictionary**  
**Category 5: Sample or Item Chemical Characteristics**



## 5. Sample or Item Chemical Characteristics

Essential Information Element	Description	Type of Information	Units	Possible Values	Notes, etc.
Analysis Run ID					A unique number describing the analysis.
Is analytical data based on raw measurement data?		Binary		Y/N	
Is analytical data based on calibrated data?		Binary		Y/N	
Describe calibration process	Document process	String			Provide summary of process or provide reference to detailed description
Is analytical data based on cleansed or altered data?		Binary		Y/N	
What rules were applied to cleanse or alter the data?		String			Need to document cleansing of data
Is analytical data based on consensus data?		Binary		Y/N	



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<b>Essential Information Element</b>	<b>Description</b>	<b>Type of Information</b>	<b>Units</b>	<b>Possible Values</b>	<b>Notes, etc.</b>
Describe process to obtain consensus	Document process	String			Need to document consensus process
What individual or team did evaluation?	Subject Matter Expert description	String			Who was Subject Matter Expert for this sample?
Is analytical data based on corrected data?		Binary		Y/N	
Describe correction process	Document process	String			Need to document correction process
Can data be linked to a process		Binary		Y/N	
What is process?		String			Need to link to a process table.
Can data be linked to a time period?		Binary		Y/N	
What is time period?		String			



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<b>Essential Information Element</b>	<b>Description</b>	<b>Type of Information</b>	<b>Units</b>	<b>Possible Values</b>	<b>Notes, etc.</b>
Date analysis start	Date at the start of the analysis	Date			
Date analysis end	Date and the end of the analysis	Date			
Physical State	Physical Form	Multiple choice		Metal, Powder, Other solid, Gas, Liquid	
Chemical State	The chemical state of the material	Multiple selection		Metal, Nitride, Oxide, Fluoride, Carbide, Other	



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<b>Essential Information Element</b>	<b>Description</b>	<b>Type of Information</b>	<b>Units</b>	<b>Possible Values</b>	<b>Notes, etc.</b>
Assay methods	The method of assay	Multiple select		Non destructive, destructive	Multiple allowed
NDA methods	Non destructive assay method	Multiple select		Calorimetry, Gamma-ray spec, neutron counting, other	Multiple allowed



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DA methods	Destructive assay method	Multiple select		SIMS, TIMS, ICP-MS, GC-MS, Ignition Gravimetry, Coulometry, Alpha spectrometry, Alpha counting, Titration, Spectrophotometry, Densitometry,	Multiple allowed



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Assay Files_n	Any images or data files associated with the assay type				
Assay comments	Comments on assay	String			
Calorimetry Energy	The total amount of energy being released	Decimal	mJ		
Calorimetry Specific power	The amount of power released per kilogram of material	Decimal	mW/g		
Compound_n		String			



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<b>Essential Information Element</b>	<b>Description</b>	<b>Type of Information</b>	<b>Units</b>	<b>Possible Values</b>	<b>Notes, etc.</b>
Compound Pct_n		Decimal	Atom, wt percent		
Compound Pct_Uncertainty_n	Uncertainty in compound makeup	Decimal	Percent		<i>Uncertainty representation recommended by data vetting group</i>
Compound Pct Uncertainty Sigma_n	Sigma level on uncertainty	String		1sigma, 2sigma, 3sigma	<i>A field to identify sigma levels, non-uniform uncertainties, etc</i>
Compound Pct uncertainty type_n	Uncertainty type	String		GUM, std dev, assigned (historical, Subject Matter Expert, calculated, pooled, analyst)	<i>A field to identify origin of uncertainty estimates</i>



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<b>Essential Information Element</b>	<b>Description</b>	<b>Type of Information</b>	<b>Units</b>	<b>Possible Values</b>	<b>Notes, etc.</b>
Compound Pct Prefix_n	Prefix describing detectable limits	String	LE, LT, GE, GT, BDL, NUL, ND		Less than or equal, less than, greater than or equal, greater than, below detection limit, no known value, not detected
Compound Pct Prefix Value_n	Compound detection value	Decimal	Atom, wt percent, ppm, ppb		Include two fields; the prefix in the prior field and this field with the actual values
Element_n	List of Elements (symbols)	String	Na	H ... Ds	
ElementPct_n	Elemental percent of entire sample	Decimal	Atom, wt. percent		



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ElementPct Uncertainty_n	Uncertainty of elemental makeup	Decimal	Percent		<i>Uncertainty representation recommended by data vetting group</i>
ElementPct Uncertainty Sigma_n	Sigma level on uncertainty	String		1sigma, 2sigma, 3sigma	<i>A field to identify sigma levels, non-uniform uncertainties, etc</i>
ElementPct uncertainty type_n	Uncertainty type	String		GUM, std dev, assigned (historical, Subject matter Expert, calculated, pooled, analyst)	<i>A field to identify origin of uncertainty estimates</i>



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<b>Essential Information Element</b>	<b>Description</b>	<b>Type of Information</b>	<b>Units</b>	<b>Possible Values</b>	<b>Notes, etc.</b>
ElementPct_Prefix_n	Prefix describing detectable limits	String	LE, LT, GE, GT, BDL, NUL, ND		Less than or equal, less than, greater than or equal, greater than, below detection limit, no known value, not detected
ElementPct_Prefix_Value n	Element detection value	Decimal	Atom, wt percent, ppm, ppb		Include two fields; the prefix in the prior field and this field with the actual values
Isotope_n	List of Isotopes (name and zam number)	String / Integer	Na	na / 10010 ... 110.... To be determined	
IsotopePct_n	Percent composition of each isotope	Decimal	Atom, wt. percent	0-100	



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<b>Essential Information Element</b>	<b>Description</b>	<b>Type of Information</b>	<b>Units</b>	<b>Possible Values</b>	<b>Notes, etc.</b>
IsotopePct_Uncertainty n	Uncertainty of isotopic compositions	Decimal	Percent		<i>Uncertainty representation recommended by data vetting group</i>
IsotopePct Uncertainty Sigma_n	Sigma level on uncertainty	String		1sigma, 2sigma, 3sigma	<i>A field to identify sigma levels, non-uniform uncertainties, etc</i>
IsotopePct uncertainty type_n	Uncertainty type	String		GUM, std dev, assigned (historical, Subject Matter Expert, calculated, pooled, analyst)	<i>A field to identify origin of uncertainty estimates</i>



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<b>Essential Information Element</b>	<b>Description</b>	<b>Type of Information</b>	<b>Units</b>	<b>Possible Values</b>	<b>Notes, etc.</b>
IsotopePct Prefix_n	Prefix describing detectable limits	String	LE, LT, GE, GT, BDL, NUL, ND		Less than or equal, less than, greater than or equal, greater than, below detection limit, no known value, not detected
IsotopePct Value_n	Isotope detection value	Decimal	Atom, wt percent, ppm, ppb		Include two fields; the prefix in the prior field and this field with the actual values
Isotope numerator_n	Isotope Numerator for ratio measurements	Multiple Selection			
Isotope denominator_n	Isotope Denominator for ratio measurements	Multiple Selection			



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<b>Essential Information Element</b>	<b>Description</b>	<b>Type of Information</b>	<b>Units</b>	<b>Possible Values</b>	<b>Notes, etc.</b>
Isotope ratio	Isotope Ratio	Decimal			
Element numerator	Element numerator	Multiple Selection			
Element denominator	Element denominator	Multiple Selection			
Element ratio	Element ratio	Decimal			
Isotopic homogeneity		Binary		Y/N	
Elemental homogeneity		Binary		Y/N	
Radiation_n	Type of radiation	Multiple Selection		Alpha, electrons, beta, gamma rays, neutrons	
Radiation energy_n	Radiation energy	Decimal	KeV, MeV		



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<b>Essential Information Element</b>	<b>Description</b>	<b>Type of Information</b>	<b>Units</b>	<b>Possible Values</b>	<b>Notes, etc.</b>
Activity	Radioactivity	Decimal	Bq, Ci		
Activity calc	Was the activity calculated or measured	Multiple select		Calculated, Measured	
Dose rate_30	Dose rate at 30cm	Decimal	Rem/hr , R/h		
Dose rate_100	Dose rate at 100cm	Decimal	Rem/hr , R/h		
Dose rate arbitrary location	Dose rate at location below	Decimal	Rem/hr , R/h		
Dose rate location	Distance from surface	Decimal	cm		
Dose calc	Was the dose calculated or measured	Multiple select		Calculated, Measured	



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<b>Essential Information Element</b>	<b>Description</b>	<b>Type of Information</b>	<b>Units</b>	<b>Possible Values</b>	<b>Notes, etc.</b>
Specific activity		Decimal	Bq/cc, Ci/cc, Bq/g, Ci/g		
SActivity calc	Was the specific activity calculated or measured	Multiple select		Calculated, Measured	
Activity Comments_n	Types of observed radiation	String			
Burnup Calc_n	Estimated burnup from each isotopic or isotopic ratio	Decimal	MWd/ MTU, % fissile		



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Burnup Calc Uncertainty_n	Uncertainty in estimated burnup	Decimal	Percent		<i>Uncertainty representation recommended by data vetting group</i>
Burnup Calc Uncertainty Sigma_n	Sigma level on uncertainty	String		1sigma, 2sigma, 3sigma	<i>A field to identify sigma levels, non-uniform uncertainties, etc</i>
Burnup Calc uncertainty type_n	Uncertainty type	String		GUM, std dev, assigned (historical, Subject Matter Expert, calculated, pooled, analyst)	<i>A field to identify origin of uncertainty estimates</i>



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Burnup_Isotopes_n	List of isotopes or isotopic ratio used to calculate the burnup				
Age date	The date the age calculations places the material at	Date			Consider multiple fields here, since multiple ages may be defined
Age date uncertainty	Uncertainty in age		Percent		<i>Uncertainty representation recommended by data vetting group, possibly a second field to identify sigma levels, non-uniform uncertainties, etc</i>
Age date Uncertainty Sigma	Sigma level on uncertainty	String		1sigma, 2sigma, 3sigma	<i>A field to identify sigma levels, non-uniform uncertainties, etc</i>



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Age date uncertainty type	Uncertainty type	String		GUM, std dev, assigned (historical, Subject Matter Expert, calculated, pooled, analyst)	A field to identify origin of uncertainty estimates
Age isotopes ratio_n	A list of isotopes used to calculate the age	Table			



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Age event	What age does the calculation calculate	Multiple select		Purified/Re processed, Enriched, End of irradiation, Beginning of irradiation, other	
Age files	Any data files used to determine age				
Age comments	Comments	String			
File upload_n	File upload	Character		Upload a list of files	
Comments_n	Comments	Character		List of comments	